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Improving Quality Thinking The Story of “Ri” (理)

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“Ri” Equals Lean Reasoning

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This paper addresses an important issue for lean practitioners. We often comment that “Lean is not just a set of tools” and need not “Copy everything from the Japanese.” When we are implementing lean. We believe a deeper understanding is necessary; it is important however that we learn from the systematic approach the Japanese take when defining and deploying the quality-related improvement methodologies as a system that differentiates responsibilities for performance. How should business leaders focus on their strategy for implementing improvement in general, and lean methods in particular?

Despite the fact that a deeper understanding is necessary, most of the literature on lean focuses on just the tools and does not adequately seek to understand the management system within which these methods and tools are employed. Yes, it is important not to just blindly copy the Japanese way of doing things, yet it is important to learn what they have added to their improvement concepts that extend beyond the toolkits that are visible to any observer.

This paper describes how thinking processes for planning and executing improvements have evolved – blending Western and Japanese thinking into a comprehensive and coherent approach for improving quality. It dates back to the birth of modern economic thinking of Adam Smith in his landmark book, *The Wealth of Nations*, to recent developments introduced by the Toyota Management System.

This paper goes beyond a “Lean-as-a-Toolkit” mindset and presents a larger concept of lean; lean as a management system that enables top management to assure system-wide attention to performance improvement. It describes logical relationships of elements in a comprehensive lean enterprise management system so that the connections between the component parts are clear and their derivation from their Japanese concepts are clear. While the Japanese words are used, these concepts are transformed into plain English to describe the core purpose and can be used by management to answer the question: “How are we managing to be efficient in our application of lean thinking?” Thus, the whole becomes greater than the mere sum of its parts as a rational thinking pattern emerges from previously disjointed lean methods and tools.

The question arises, can organizations embrace this thinking challenge? Or will they claim to have already tried and found that this way is not compatible with their culture? Emerging ideas of “Jishu Kanri,” “Jishuken,” and “Ji Kotei Kanketsu” may serve companies well but their most difficult challenge will be coping with a need to “creatively destroy” their legacy of “strategic thinking” to embrace the new perspective of continual improvement delivered in this paper.

Introduction

In 1777 Adam Smith wrote *The Wealth of Nations* which enshrined the principle of “Division of Labor” that exists between management and labor: management conducts planning whereas labor executes.¹ The tacit implication of this split in responsibilities is that predominantly managers make decisions and workers to execute these decisions. However, Japanese quality professionals have interpreted this approach towards work and the respective roles of people involved in this structure in a different way. The Japanese way is to define work contributions and the role that human rationality has in the process of daily management as a more comprehensive and holistic organizational activity that involves participants at all levels in the structural hierarchy. It applies to all employees, at all levels, and not just to the “workers” doing operational tasks.

The concept of human rationality is built into many of the familiar concepts that are described as elements in a Japanese production system and this becomes evident when the etymology of the original kanji text is closely examined. The kanji character “Ri” (理) describes “reason” or “logic” and it originates from the original Chinese radical which means “to polish jade.” The act of polishing jade is much more difficult than polishing gems with a more regular and predictable crystalline structure such as diamonds, sapphires, or rubies. Jade has a very unusual mineral structure that challenges the jeweler who wants to polish it to gem quality. This is due to the stone’s highly textured and chaotic crystalline structure having fibers that are intertwined in swirling patterns that are so difficult to polish that the jeweler must really think about how to polish it properly. In order to convert the raw jadestone into a fine gem requires that the polisher: make a detailed examination of its inherent patterns; reflect thoughtfully on the best approach to improve its surface to a gleaming texture; and act in an insightful way to make the right movements that result in the desired improvement. These are actions of a cognitive working process – the characteristics that define “ri” in the Japanese management system.

This “Ri” character is typically used to describe complex situations and applies in the following constructs of Japanese words that relate to concepts for the design and execution of company-wide lean systems that improve work:²

- Kanri (管理): A logical way of working or “management system”
- Genri (原理): Original cause; the “first thing that does not need others” or “real reason”
- Seiri (整理): An “unorganized rationality for working” or “chaotic rational structure”
- Muri (無理): A rule to avoid “impossible demands” or “thou shalt not have bad thinking”

Deciding what is the real action required to eliminate organizational chaos and avoid waste that is caused by poor decision making are key focus areas in all improvement actions. Taiichi Ohno identified three “ideas,” “observations,” or “golden rules” to help define how to organize

the workplace so that it avoids waste generation:

“Insufficient work standardization and rationalization create waste (“Muda”), inconsistency (“Mura”), and unreasonableness (“Muri”) in work procedures and work hours that will eventually lead to the production of defective products.”³

These ideas apply equally to all employees at all levels of an organization – thus, making of poor decisions and irrationality should be avoided equally in the executive realm of an organization as it should in the supervisory and the operational realms of that organization. What does this comment imply? One way of thinking about this question is that organizations should be managed so that they: “waste not” and “want not” – to adapt an old American expression that is commonly attributed to Benjamin Franklin who did observe that “haste makes waste.”⁴ This observation was first expressed in 1772, but an earlier version has been traced back to 1576: “willful waste makes woeful want.”⁵ Clearly the impact on production of waste from poor rationality or the lack of a “will to reason properly” has been observed by reflective thinkers for some time.

Let us examine how this “Ri” category of waste can arise across an organization, starting at the top of an organization with the executive function. Why should translation of a Japanese term be meaningful to an executive today? Taiichi Ohno described problems in the cross-cultural communication about quality:³

“I have always said that the Japanese language is ever well put together, and if the Japanese language is interpreted skillfully it would help the development of the Japanese industry this does not work so well in other languages.”

“The Japanese writing system is very convenient I think the Japanese writing system has contributed a lot to industry by helping people understand both actual and potential misconceptions.”

Thus, the “sage of production operations theory” identified this issue of understanding as a prerequisite – learning the true meaning of Japanese words BEFORE explaining them in another language.

A Cognitive Model for “Executive ‘ri’ Waste”

Executive decision-making influences the direction and execution of work across the entire end-to-end organization. Early books on this topic (e.g., Chester I. Barnard⁶ and Herbert A. Simon⁷) were incorporated into the ideas of Peter Drucker regarding how to be an effective executive.^{8,9} This focus on making rational decisions at the executive level of an organization established the value of good information in making choices for the organization. Talking about the role of an executive advisor Drucker commented that: “It is the job of staff to clearly report necessary information that CEOs can easily assimilate and understand, so they may draw their own conclusions.”¹⁰ In making this comment, Drucker was reinforcing the point made through

the earlier Barnard-Simon concept that Simon summarized in a principle that he called “bounded rationality.” He observed that “boundedly rational” decision-makers were constrained by three factors in their ability to draw “quality” decisions:¹¹

- (1) The information upon which they base their decision must have integrity – the data must speak the truth about the facts it observes;
- (2) The decision-maker must have competence to make the decision (e.g., in the subject matter and in interpretation of the decision-support methods); and
- (3) The sense of urgency about the need to make a decision should not impact on the ability of a decision-maker to clarify the issue or request sufficient data.

Whenever these three conditions are met then a decision-maker is able to make a “boundedly rational decision” – however, if one of the conditions is not met, then the rationality of choice is impinged as the “Kanri” fails to operate and the decision-maker loses his or her “Genri” to become compromised in their process as their “Seiri” becomes dominant and the resultant chaos ensures that “Muri” prevails throughout the organization.

Since it is an executive function to dispense the resources required to manage and improve an organization, it is clear that lack of clarity in these three elements can lead an organization toward “structural and irrational chaos.” In the case where executive “Muri” is deployed into the organization (e.g., through bad decision-making or infrastructure and organizational choices), this will generate flow waste (“Mura” (無班)) in the cross-functional processes (e.g., through additional work required for managing a non-rationalized infrastructure or management system) which will in turn create disciplinary waste (“Muda” (無駄)) in work at the operational level – “Muda” that the workers cannot remove as it was generated by the infrastructure established by poor executive decisions that were mandated by executives. If an organization is contaminated by executive “Muri” then the systemic “Kanri” will eventually fail as “Seiri” takes over as the “Genri” of the disorganized actions that produce the workplace “Muda.”

A Cognitive Model for “Worker ‘ri’ Waste”

One aspect of “ri” relates to the worker and is reflected in the aspiration to “Waste Not” which refers to operation of the daily management system for productive flow of an organization’s processes that is managed by workers in the workplace. In this case proper “Ri” is achieved by reflection on the way that a worker can eliminate wasteful “Muri” by focusing on the root cause or “Genri” using “Seiri” to find and eliminate chaos and thereby assure that the “Kanri” operates effectively, efficiently, and economically. In this approach workers develop self-examination practices for reflection to discover the means to improve.

In *Out of the Crisis*, Deming proposed that 15% of the problems in an organization come

from workers while the remaining 85% are management's responsibility.¹² Deming was challenging the tradition in Western management to blame the workers for poor productivity and mistakes. However, Japanese management takes the opposite approach. Taiichi Ohno was very puzzled by Deming's statement. In *Just-in-Time for Today and Tomorrow*, Ohno said:

"I am not sure where the 85 percent of Professor Deming's presidential responsibility comes from.... In most cases, a serious lack of humane leadership in the area of workplace management on the part of the president probably existed.... For American management in the past 85 percent indicates an inconceivable sense of responsibility. I think the Toyota production system's success depend on the president assuming 100-percent responsibility."¹³

In traditional Japanese management is for the Chief Executive to accept responsibility for poor performance of the entire organization. Daily work is regularly self-managed by operators who develop and perform standardized work ("Seiketsu" (清潔)) and thereby achieve discipline to sustain predictable performance ("Shitsuke" (躰)) where the routine work is performed "without being told what to do" by the supervisor. This is way that "Ji Kotei Kanketsu" (JKK) (自工程完結) operates. JKK means acceptance of process ownership by the operators and it supports two related concepts: daily management and the assignment of decision rights to workers for stopping production to assure that poor quality is not passed on to the next step in the process. In order to realize JKK at the shop floor, operators must learn to understand the definition of abnormality from an engineering perspective, and this should become common to everyone and shared through training. Each operator must fulfill one's responsibility to build quality in the process and assume an obligation to stop production in one's process upon discovering any abnormality. JKK also encourages each operator to make autonomous efforts for continual improvement.¹⁴ The application of JKK may be extended from the operator level to workers at supervisory and management levels by concentrating on their responsibility for coordination of flow-related activities, and also to senior managers and executives by focusing on executive decision-making and resource allocation for generation of improvement.

What are the conditions that are required for managing responsibility for quality and attaining personal self-control? Drucker,¹⁵ Deming,¹⁶ and Juran¹⁷ all agree that responsibility for quality results can be properly delegated to lower organization levels by the executive function. But this is appropriate, if and only if, the following conditions are met:

1. Clearly defined objectives and performance targets are mutually agreed and knowledge of what the process is supposed to do as well as what it is currently doing. The process itself must be capable of meeting its target and responsive to actionable controls,
2. Resources, training, and measurements required for action are provided to the workers and they are trained in the proper way to operate the procedures and control mechanisms of the process. The act of adjusting

these controls must not be personally distasteful to the worker or require excessive exertion, and.

3. Decision rights are delegated to permit self-regulation of work activities by the workers and they have the ability to do so. Specifically, the workers should be delegated the authority to determine at what point the process adjustments should be made and be given the authority to halt operations when process adjustment no longer operates effectively, and corrective action can be taken.

However, as Yoshio Kondo pointed out in his book *Human Motivation*, increasing a worker's ability to exercise self-control over work leads to increasing their self-confidence in working and their willingness to participate in team activities which, in turn, leads to developing a keen interest in the work of their colleagues.¹⁸ This outcome is called "Jishuken" (自主権).

"Jishuken" is a team-based approach used to encourage and drive "Kaizen" (改善) activities where people involved are organized into teams whose purpose is to identify specific areas that need continual process improvement and to spread information throughout the organization and thereby stimulate and initiate "Kaizen" projects that change organizations "for the better." The literal meaning of "Jishuken" is "a fresh set of eyes" (implying autonomy) which suggests that sometimes workers may be too close to a problem and this keeps a person from seeing what is wrong with the process – they have become accustomed to waste, so it no longer appears as waste to them. Using autonomous study groups for conducting an inquiry into the problem provides the "fresh eyes" for those who have been carrying out the work of the daily management system. If a process engineer assists a supplier in correcting a problem, this may also be called a "Jishuken" team. "Jishuken" teams also include quality circles of production operators, improvement project teams, and cross-functional steering committees. These teams engage workers collectively in an activity that is part of a "Jishu Kanri" (自主管理) management system.

"Jishu kanri" literally means a "self-mastery management system" where the meaning implies "each worker is an inspector." This term applies to independent, self-regulated or autonomous work management, voluntary participation, and self-control of daily work systems used for the routine management of Japanese companies. Work is conducted in "Jishuken" teams, supported by human resource practices such as information sharing, job rotation, employment security, and profit sharing. How does this self-mastery management system operate? The answer is found in "Hansei" (反省).

"Hansei" describes an introspective approach that literally refers to mental acts that lead to increased self-awareness through self-reflection, reconsideration, meditation, introspection, or contemplation. It is a process of recognizing and reflecting on mistakes and following through by taking actions, so these mistakes are not repeated. It requires situational awareness to notice the problem and sensemaking to understand how the problem evolved so that action

can be taken to improve. Taking personal ownership for the mistake is a critical part of “Hansei” reflection along with individual acceptance that the act was committed wrongly. “Hansei” occurs during the “Check” steps of the PDCA and SDCA cycles. It is the “checking” of one’s own thoughts and behavior that led to making errors so they may be corrected. What is the final objective of this self-regulating system of management? The answer is “Wa” (和).

“Wa” is created when workers collaborate to achieve a common objective. The result of their collaboration should become “Wa” when emphasis is placed upon taking full advantage of the unique capabilities that people possess to contribute to improve the way an organization works and collaborates. The outcome of their collective efforts should be to achieve harmony, peace, and balance. It is the cooperation of people that achieves desired results across the flow of work. But it is not possible to achieve this condition if the final cognitive model for “Ri” is also not developed.

Linking and Aligning Organizational Decision-Making

The second aspect of “Ri” that was mentioned previously describes how reason works within the aspiration of “Want Not” or management of resources. This aspect requires appropriate application of the concept of “Tenkai” (展開). The root meaning of “Tenkai” is to unroll a kimono after it has been packed for travel. In modern application, it describes deployment of resources and management objectives into an organization as they are “rolled out” or “flow down” into an organization. Part of this activity is also the alignment of the work across the level as the flow occurs. When “Tenkai” is coupled with the distribution or allocation of the organization’s resources that accompany the deployment of performance objectives and change initiatives and the negotiated dialog that occurs between organizational levels about the direction of the improvement and the assignment of the resources, then this is named using the Western word “catchball.”

The catchball term was coined by Kenzo Sasaoka, President of Yokagawa Hewlett-Packard (YHP) in the late 1970s as he led the YHP division in its pursuit of the Deming Prize.¹⁹ The image of catchball is of a group of children playing ball and randomly passing it around a circle while ensuring that all involved have an opportunity to catch and throw the ball. A process that is used in the “Hoshin Kanri” (方針管理) strategic planning process to communicate cross-organizationally in both vertically and horizontally axes to obtain consensus of all of the implementers on the project approach and means that will be used to attain each “Hoshin” (breakthrough) objective will be met through focused improvement projects. A dialog between managers and their employees occurs during which data, ideas, and analysis are thrown around like a ball in a circle of children. This encourages productive dialogue across the entire company. Fuji Xerox also referred to the same concept as “everyone having their fingerprints” on the final change improvement solution to assure that they were committed to implementing the needed changes. This participative approach in formulating strategy and deploying it into organizations is a hallmark of the “Kanri” system of management. There are four components

that are engaged as elements of the way a catchball process is implemented within a “Kanri” system that together enable the “Tenkai” of “Kaizen” improvement projects. These four elements of an interactive catchball process are:

- “Tatakidai” (叩き台) literally means “a chopping board,” and describes the conversation or dialog for discussing improvement ideas across different organization levels from the originating level to the approving level. “Tatakidai” is a process for submitting a tentative plan to next higher level for discussion and approval and provides an opportunity to critique the proposal status and identify problems associated with it without criticizing the person making the proposal. This method is initially used in a catchball dialog in the “Hoshin” planning process and generate consensus across the organization on key focus areas to improve.
- “Nemawashi” (根回し) means “preparing the ground for planting.” It describes a careful step-by-step process for transplanting a bonsai tree from an old pot to a new pot. This is an informal process for laying the foundation for a proposed change by talking with the people who are involved or will be affected to gather feedback, obtain local support and buy-in for execution of the change prior to announcement of the change. “Nemawashi” is a negotiation process that occurs in deployment of the objectives and allocation of resources in the catchball process.
- “Ringiseido” (稟議制), also called a “Ringi” system, represents a shared decision-making process, which encourages open input, consensus and ownership among individuals in an organization who are at different levels of authority. This is achieved by gathering input from people further down an organization and circulating it across management, without more senior management forcing their own ideas on others, but providing thoughts and feedback based on principles. This “Ringiseido” process encourages consultation between the managers and people at the working level of the organization. The “Ringiseido” process satisfies the Japanese cultural desire for harmony among people. The physical action of “Ringiseido” is called the “Ringi” decision-making process and it fosters an environment of support and agreement for a decision once a manager with final authority has reviewed and accepted a recommended decision.
- “Hourensou” (報連相) literally means “spinach” in Japanese but this has nothing to do with its meaning in the sense of a quality management system. “Hourensou” is a word that has been created from three other words: (1) “Hokoku” (報告) meaning to report; (2) “Renraku” (連絡) meaning to inform or give periodic updates; and (3) “Soudan” (相談) meaning to consult or advise. Managers use this term to describe a process of frequent reporting, touching base and discussing, as a means for keeping in touch with what is going on in their organization (it helps to serve the internal communication function of “Genichi Genbutsu” (現地現物) or “go to the actual or real place and see what is

actually happening or the real thing” that is going on in the “Gemba” (現場) – the place where real work is accomplished.

The job of each worker or employee is to improve the flow of the work – eliminating “Muda” in activities of their daily management system. The job of the supervisor or manager is to deploy resources effectively (using a “Ri” thinking process that avoids “Muri”) to enable achievement of breakthrough “Hoshin” projects. The task of resource allocation is a crucial role of management as it assures that workers “want not” for the resources necessary to improve the entire end-to-end flow of the business system, thereby eliminating “Mura.” Whenever management deploys tasks or establishes requirements for work, it must also assure that the workers receive the appropriate resources (e.g., equipment, training, software, etc.) to carry out the objectives. It is the role of middle level management in an organization to disseminate the policy articulated by the executive function, formulate the programs that implement these policies into a set of coherent initiatives and action projects, and to allocate resources that enable the teams to accomplish the necessary changes and deploy the implementation of these changes into the standard work of the organization.

Conclusion

Once the subtleties of the meaning behind the “Kanji” terms used to describe the “Ri” thinking processes that are involved in the Japanese system of “Kanri,” it is possible to define how this way of thinking defines a comprehensive and integrated approach that encompasses both strategic and workplace management. The emphasis of workplace management is placed on the elimination of waste throughout the operating system – “waste not” summarizes this type of effort. Emphasis of strategic management is placed upon the proper allocation of financial resources of the organization to assure that the operating system can operate with efficiency, effectiveness and economically – “want not” in terms of its capability to perform based on the flow of resources to support appropriate capacity development. Therefore, “Ri” – or taking a reflectively rational approach to studying and understanding the way that the organization is really working at the operational level – is an essential ingredient in the “Kanri” system of systems that will enable the integration of the work flow with the resource flow to assure that “balance” can be achieved in the way that an organization responds to the commercial challenges of its market.

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